Phenotyping of feed intake in small ruminants – How to do in practice?

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Feed efficiency is a trait of major interest because breeding efficient animals is not only cost-saving but also leads to a decrease of environmental impacts. The genetic improvement of this trait requires feed intakes to be recorded individually. Sheep and goats are gregarious animals that are reared in group so either several individual devices are available (one for each individual) or one device can handle the feeding of several animals. Automated concentrate feeders (ACF) exist for small dairy ruminants. They deliver concentrate in the milking parlour, but the hypothesis is that all the delivered concentrate is eaten by the animal. Other ACF have been developed, mainly for research purposes. Very few devices enable the recording of forage intakes (AFF) when animals are reared in groups whereas small ruminants are mainly fed with forage. At INRAE, we developed ACF that can be used in ad libitum or restricted version, AFF and automated water dispensers. These three feeders return data for each visit (quantity and duration). This high-throughput recording is of high value. In combination with other biological data, feed intakes can be analysed to study feed efficiency but also responses to nutritional or infectious challenges. The succession of visits between animals gives hints for social interactions' studies. The duration of visits is also included in behavioural analyses. These large datasets can also help in identifying major events (technical, meteorological, health …) and then to test the resilience of animals under these stressful events. Current research programs aim at identifying proxies for feed intakes automated feeders, remain expensive devices.

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